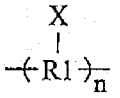
REMARKS

This Amendment is submitted in response to the non-final Office Action mailed on June 9, 2008. No fee is due in connection with this Amendment. The Director is authorized to charge any fees which may be required, or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 112857-447 on the account statement.

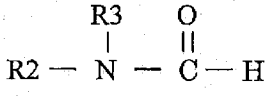
Claims 18-19 and 21-34 are pending in this application. Claims 1-17 and 20 were previously canceled without prejudice or disclaimer. Claims 22-34 were previously withdrawn from consideration. In the Office Action, Claims 18-19 and 21 are rejected under 35 U.S.C. §102 or, alternatively, under 35 U.S.C. §103. In response, Claims 18 and 21 have been amended. Applicants note that Claim 21 has been amended solely for clarification purposes. These amendments do not add new matter. At least in view of the amendments and/or for the reasons set forth below, Applicants respectfully submit that the rejections should be withdrawn.

In the Office Action, Claims 18-19 and 21 are rejected under 35 U.S.C. §102(b) as being anticipated by, or alternatively, under 35 U.S.C. §103(a) as being unpatentable over Japanese Patent Publication No. 2000-082329 to Tsuchida et al. ("*Tsuchida*"). In response, Applicants have amended independent Claim 18. In view of the amendment and/or for at least the reasons set forth below, Applicants respectfully submit that *Tsuchida* fails to disclose or suggest each and every element of the present claims.

Currently amended independent Claim 18 recites, in part, a proton conductor, including an integrated complex composed of: a first compound having a first structural part having a first formula:



where R1 represents a component including carbon, X represents a protoic dissociation group, and n $\leq$1; and a second compound having a second structural part having a second formula:



where R2 and R3 represent a component including carbon or hydrogen, respectively, wherein a number of moles of the first compound is a, a number of moles of the second compound is b, and a ratio of the number of moles b to the number of moles of the protoic dissociation group (a×n) is greater than or equal to 10 and less than or equal to 30. These amendments do not add new matter. The amendments are supported in the Specification at, for example, page 4, paragraph 48, lines 1-5; paragraph 58, lines 1-6; page 5, paragraph 62, lines 1-7; paragraph 66, lines 1-20; page 6, paragraph 86, lines 1-4; page 7, paragraph 95, lines 10-12; paragraph 97, lines 12-15.

Due to the increasing demand for solid electrolyte fuel batteries, single ion or proton conductors are highly desirable. See, Specification, page 1, paragraph 3, lines 13-18; paragraph 4, lines 1-5. However, prior art proton conductors such as polyethylene glycol ion conductive macromolecules have had problems of low conductivity at high temperatures due to lack of moisture. See, Specification, page 1, paragraph 5, lines 1-14. In light of these problems with prior art single ion conductors, the present claims are directed to a proton conductor that is an integrated complex of a first compound of a first general formula and a second compound of a second general formula. See, Specification, page 1, paragraph 10, lines 1-4; page 2, paragraph 16, lines 1-7; paragraph 19, lines 1-6; page 3, paragraph 34, lines 1-11. The first compound includes a protoic dissociation group. See, Specification, page 4, paragraph 49, lines 1-3. Because the =NCOH group of the second compound interacts with protons in the protoic dissociation group of the first compound to thereby conduct protons, the mole ratio of the protoic dissociation group to the second compound is a factor that largely affects proton conductivity. See, Specification, page 4, paragraph 57, lines 1-8. If the mole ratio of the second compound is too small, proton conductivity is decreased because protons are not migrated smoothly; however, if the mole ratio is too large, proton conductivity is low because the amount of carrier protons of the first compound is small. See, Specification, page 4, paragraph 58, lines 7-12. The highest ion conductivity of the proton conductor occurs when the mole ratio of the second compound to the number of moles of the protoic dissociation group is greater than or equal to 10 and less than or equal to 30. See, Specification, page 4, paragraph 58, lines 1-6; page 5, paragraph 59, lines 4-9; Figure 1. In contrast, *Tsuchida* fails to disclose or suggest every element of the present claims.

For example, *Tsuchida* fails to disclose or suggest a proton conductor, including an integrated complex composed of a first compound having a first structural part of the first claimed formula and a second compound having a second structural part of the second claimed

formula as recited, in part, by currently amended independent Claim 18. The Examiner asserts that *Tsuchida* discloses a proton conductive substance formed from two polymers, one of which is a compound of the first claimed formula, that further comprises N′-dimethylformamide solvent, a compound of the second claimed formula. See, Office Action, page 3, lines 22-23; page 4, lines 1-5. However, the portion of *Tsuchida* cited by the Examiner merely discloses that sulfate groups are introduced into the precursor polymer using a sulfating agent such as N,N'-dimethylformaldehyde-sulfur trioxide complex. See, *Tsuchida*, [0020]. The only disclosure in *Tsuchida* of N′-dimethylformamide is as a solvent. See, *Tsuchida*, [0021], [0025], [0027]. Nowhere does *Tsuchida* disclose or suggest that the N′-dimethylformamide solvent of the second claimed formula is part of an integrated complex with the polymer of the first claimed formula to form the proton conductive material, nor does the Examiner cite support for such claimed element. Therefore, Applicants respectfully submit that the proton conductive substance of *Tsuchida* does not comprise an integrated complex composed of a polymer of the first claimed formula and a compound represented by the second claimed formula.

As acknowledged by the Examiner, the N′-dimethylformamide compound of *Tsuchida* is merely used as a solvent. See, Office Action, page 4, lines 4-5. Because *Tsuchida* states that "an organic polarity solvent such as. . . dimethylformamide. . . may be mixed with the conductive macromolecular material of the present invention," the solvent cannot be part of the conductive macromolecular material itself. See, *Tsuchida*, [0025]. *Tsuchida* is entirely directed to a proton conductive material composed of two polymers different from the first and second compounds of the claimed integrated complex. See, *Tsuchida*, [Abstract], [0014]-[0015]. Indeed, *Tsuchida* specifically states that its conductive macromolecular material "is composed of a polymer having a sulfate group or a sulfuric acid group in the molecule and a polymer expressed by a general formula – (R_1-X)." See, *Tsuchida*, [Abstract], [Solving Means]. Therefore, *Tsuchida* fails to disclose a proton conductor, including an integrated complex composed of a first compound having a first structural part of the first claimed formula and a second compound having a second structural part of the second claimed formula in accordance with the present claims.

Moreover, *Tsuchida* fails to disclose or suggest an integrated complex composed of a first compound and a second compound wherein a number of moles of the first compound is a, a number of moles of the second compound is b, and a ratio of the number of moles b to the number of moles of the protoic dissociation group (a×n) is greater than or equal to 10 and less

than or equal to 30 as required, in part, by the present claims. The Examiner asserts that *Tsuchida* teaches a mixing ratio of the polymer with the sulfate or sulfuric acid molecule to the polymer of the first claimed formula between 95/5 and 5/95 by weight. See, Office Action, page 4, lines 5-7. The Examiner then equates the weight ratio to the mole ratio. See, Office Action, page 4, line 7. However, Applicants respectfully submit that a mole ratio is distinct from a weight ratio. The number of moles of a substance is equal to the weight of the substance divided by its molecular weight. Because two substances can have different molecular weights, the weight ratio of the substances is not necessarily equal to the mole ratio of the substances. Thus, the cited weight ratio is not equivalent to a mole ratio.

Furthermore, even if the ratio cited by the Examiner were a mole ratio, it is a mole ratio of the polymer with the sulfate or sulfuric acid molecule to the polymer of the first claimed formula, not a mole ratio of the number of moles of the second compound, b, to the number of moles of the protoic dissociation group (a×n) as required, in part, by the present claims. As discussed previously, the only discussion in *Tsuchida* of a compound of the second claimed formula, such as N′-dimethylformamide, is as a solvent. The polymer with the sulfate or sulfuric acid molecule can include a sulfating agent such as N,N'-dimethylformaldehyde-sulfur trioxide complex. See, *Tsuchida*, [0020]. However, N,N'-dimethylformaldehyde is not a compound with a structural part of the second claimed formula, since it does not contain a nitrogen atom. Thus, the number of moles of the polymer with the sulfate or sulfuric acid molecule is not the number of moles of the second claimed compound. As such, the ratio cited by the Examiner is not a mole ratio of the number of moles of the second compound, b, to the number of moles of the protoic dissociation group (a×n).

The Examiner further asserts that "the mole ratio of sulfate radical to polymer disclosed by *Tsuchida* is less than 10." See, Office Action, page 4, lines 9-10. However, the present claims specifically recite an integrated complex wherein a ratio of the number of moles b to the number of moles of the protoic dissociation group (a×n) is greater than or equal to 10 and less than or equal to 30. Therefore, if the mole ratio is less than 10, as the Examiner acknowledges, *Tsuchida* fails to disclose the claimed mole ratio, which is greater than or equal to 10. Nevertheless, as discussed previously, this mole ratio is not the ratio of the number of moles of the second compound, b, to the number of moles of the protoic dissociation group (a×n). Therefore, *Tsuchida* fails to disclose or suggest an integrated complex composed of a first

compound and a second compound wherein a number of moles of the first compound is a, a number of moles of the second compound is b, and a ratio of the number of moles b to the number of moles of the protoic dissociation group (a×n) is greater than or equal to 10 and less than or equal to 30 in accordance with the present claims.

Accordingly, Applicants respectfully request that the rejection of Claims 18-19 and 21 under 35 U.S.C. §102(b) or, alternatively, under 35 U.S.C. §103(a) to *Tsuchida* be withdrawn.

For the foregoing reasons, Applicants respectfully submit that the present application is in condition for allowance and earnestly solicit reconsideration of same.

Respectfully submitted,

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